

## The 25th International Symposium on Polar Sciences

심포지엄

Mon 4/8/2019 8:24 PM

To: 권영신 극지해양과학연구부 <kwonys@kopri.re.kr>;

Dear Miss. Young Shin Kwon,

Thank you for submitting your abstract to the 25th International Symposium on Polar Sciences.

On behalf of Organizing Committee of the 25th International Symposium on Polar Sciences, I am pleased to inform you that the abstract, "SPATIAL VARIABILITY OF THE SURFACE PHYTOPLANKTON BIOMASS IN THE ROSS SEA DURING THE SUMMER IN 2018/2019", submitted by you has been accepted for a poster presentation session.

Please refer to the draft time table for the symposium below and kindly confirm your attendance by reply to this mail.

Date	Time	Auditorium	Int'l Conference Room	Atrium
May 14	0900-0930	Greeting	-	-
	0930-1000	Plenary Lecture 1	-	-
	1000-1200	Geological and Geophysical (& Biological) processes in Circum-Antarctic Ridges	-	-
	1300-1330	Special Lecture 1	-	-
	1330-1530	Changing Arctic Ocean: Understanding the impacts of climate changes and their global consequences 1	-	-
	1530-1600	-	-	Poster Session & Coffee Break
	1600-1800	Response of the Southern Ocean to the Changing Climate	Past analogue for future Arctic: Glacial and oceanographic perspective 1	-
May 15	0900-0930	Plenary Lecture 2	-	-
	0930-1130	Past analogue for future Arctic: Glacial and oceanographic perspective 2	Changing Arctic Ocean: Understanding the impacts of climate changes and their global consequences 2	-
	1300-1330	Special Lecture 2	-	-
	1330-1530	Rapid change in Arctic sub-seabed	-	-
	1530-1600	-	-	Poster Session & Coffee Break
	1600-1800	Late Quaternary Ocean-Cryosphere interactions in the Antarctic Ocean	-	-

Sincerely yours,  
The 25th ISPS Secretariat

# SPATIAL VARIABILITY OF THE SURFACE PHYTOPLANKTON BIOMASS IN THE ROSS SEA DURING THE SUMMER IN 2018/2019

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## ABSTRACT

Surface biological productivity in the ocean is a key controlling factor to estimate carbon dioxide sink capacity. However, the observational data to understand ecological dynamics in the Ross Sea are still significantly limited. In this study, we present the phytoplankton biomass estimated by continuous underway measurements of O<sub>2</sub>, pCO<sub>2</sub>, biological oxygen saturation ( $\Delta O_2/Ar$ ), and fluorescence on IBRV Araon cruise across the Ross Sea in December 2018 – February 2019. Phytoplankton biomass ranged from <1 mgL<sup>-1</sup> to ~10 mgL<sup>-1</sup> Chl-a, with the highest values observed in regions of Terra Nova Bay (TNB) and the lowest values observed in Cape Hallett near the continental shelf break. pCO<sub>2</sub> and O<sub>2</sub> exhibited large spatial gradients (about 150 to 450  $\mu$ atm and 250 to 500  $\mu$ M, respectively) and covaried with phytoplankton biomass. In TNB in early-January, significantly under-saturated pCO<sub>2</sub> values (~200  $\mu$ atm) were observed. During the revisit in this area from 21 January, low pCO<sub>2</sub> values of 200~250  $\mu$ atm were still persisted implying bloom period maintained throughout a month of January. On the other hand, in the northern region near Cape Hallett where Chl-a showed the lowest value near zero, pCO<sub>2</sub> values near saturation of ~ 450  $\mu$ atm were observed probably due to low drawdown of CO<sub>2</sub>. The measurements of  $\Delta O_2/Ar$  using mass spectrometry offer an opportunity to investigate net community production (NCP), the difference between net primary production and heterotrophic respiration. Such NCP derived from  $\Delta O_2/Ar$  can be considered a real-time proxy of primary production. Therefore, comparing the measurement data of pCO<sub>2</sub>, and O<sub>2</sub> with NCP is expected to allow us to determine if the biological controls overwhelm the influences of the deep water entrainment and air-sea gas exchange during the summertime in the Ross Sea.